

L Number	Hits	Search Text	DB	Time stamp
1	24	"5029982"	USPAT	2004/05/24 13:40
2	1	"6496177"	USPAT	2004/05/24 13:40
3	366	345/101	USPAT	2004/05/24 13:41
4	37	345/617	USPAT	2004/05/24 13:41
5	254	345/684	USPAT	2004/05/24 13:41
6	57	715/528	USPAT	2004/05/24 13:42
7	712	345/101 or 345/617 or 345/684 or 715/528	USPAT	2004/05/24 13:42
8	179	(345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 and temperature\$1)	USPAT	2004/05/24 13:47
9	93	(345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)	USPAT	2004/05/24 13:49
10	33	(345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)same (time or period)	USPAT	2004/05/24 13:51
11	12	(345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same (contrast\$4 same temperature\$1)same (time or period)	USPAT	2004/05/24 14:11
12	10	(345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same (contrast\$4 same temperature\$1)same (time or period) and ambient	USPAT	2004/05/24 14:11
13	11	(345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same (contrast\$4 same temperature\$1)same (time or period) and (ambience or environment or ambient)	USPAT	2004/05/24 14:12
15	9	(345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same (contrast\$4 same temperature\$1)same (time or period) and (ambience or environment or ambient) same temperature	USPAT	2004/05/24 14:19
16	20	(345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature	USPAT	2004/05/24 14:19
17	20	(345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same (ambient near3 temperature)	USPAT	2004/05/24 14:19
18	8	(345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same (ambient near3 temperature)same contrast\$3	USPAT	2004/05/24 14:33
19	47	((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)same (time or period))	USPAT	2004/05/24 14:33
20	17	((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)same (time or period))) and contrast\$4 near5 adjust\$5	USPAT	2004/05/24 14:33
21	12	((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)same (time or period))) and (contrast\$4 near5 adjust\$5) near10 temperature	USPAT	2004/05/24 14:34
22	2	((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)same (time or period))) and (contrast\$4 near5 adjust\$5) near10 temperature same measur\$6	USPAT	2004/05/24 14:40
23	2	((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) and (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)same (time or period)))) and (contrast\$4 near5 adjust\$5) near10 temperature same measur\$6	USPAT	2004/05/24 14:40
24	1	(processor\$1 or gui or interfac\$3 or instruction\$1) and (((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) and (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)same (time or period)))) and (contrast\$4 near5 adjust\$5) near10 temperature same measur\$6	USPAT	2004/05/24 14:44

25	0	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) and (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) and scroll\$3 near4 bar	USPAT	2004/05/24 14:44
26	40	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) and (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) and (contrast\$4 same temperature\$1) same (time or period))))	USPAT	2004/05/24 14:45
27	712	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) or (345/101 or 345/617 or 345/684 or 715/528))	USPAT	2004/05/24 14:45
28	0	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) or (345/101 or 345/617 or 345/684 or 715/528)) and scroll44 near3 bar	USPAT	2004/05/24 14:45
29	72	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) or (345/101 or 345/617 or 345/684 or 715/528)) and scroll\$4 near3 bar	USPAT	2004/05/24 14:45
30	77	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) or (345/101 or 345/617 or 345/684 or 715/528)) and (slid\$3 or scroll\$4) near3 bar	USPAT	2004/05/24 14:46
31	34	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) or (345/101 or 345/617 or 345/684 or 715/528)) and (slid\$3 or scroll\$4) near3 bar same (interfac\$4 or gui)	USPAT	2004/05/24 14:49
32	2	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) or (345/101 or 345/617 or 345/684 or 715/528)) and contrast\$4 same (slid\$3 or scroll\$4) near3 bar same (interfac\$4 or gui)	USPAT	2004/05/24 14:47
33	0	((((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period)))) or (345/101 or 345/617 or 345/684 or 715/528)) and contrast\$4 same (slid\$3 or scroll\$4) near3 bar same (interfac\$4 or gui) same temperature41	USPAT	2004/05/24 14:48

34	0	((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period))) or (345/101 or 345/617 or 345/684 or 715/528)) and contrast\$4 same (slid\$3 or scroll\$4) near3 bar same (interfac\$4 or gui) same temperature\$1	USPAT	2004/05/24 14:48
35	0	((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period))) or (345/101 or 345/617 or 345/684 or 715/528)) and contrast\$4 same (slid\$3 or scroll\$4) near3 bar same temperature\$1	USPAT	2004/05/24 14:48
36	2	((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period))) or (345/101 or 345/617 or 345/684 or 715/528)) and contrast\$4 same (slid\$3 or scroll\$4) near3 bar same (interfac\$4 or gui)	USPAT	2004/05/24 14:58
37	0	((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period))) or (345/101 or 345/617 or 345/684 or 715/528)) and contrast\$4 same (slid\$3 or scroll\$4) near3 bar same (interfac\$4 or gui) and temperature	USPAT	2004/05/24 14:58
38	0	((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1)) or (((345/101 or 345/617 or 345/684 or 715/528) and adjust\$5 same ambient near3 temperature) or ((345/101 or 345/617 or 345/684 or 715/528) and (contrast\$4 same temperature\$1) same (time or period))) or (345/101 or 345/617 or 345/684 or 715/528)) and contrast\$4 same (slid\$3 or scroll\$4) near3 bar same temperature	USPAT	2004/05/24 14:58
39	0	contrast\$4 same (slid\$3 or scroll\$4) near3 bar same temperature	USPAT	2004/05/24 15:00
40	39170	contrast\$4 same temperature	USPAT	2004/05/24 15:00
41	2595	contrast\$4 same temperature near5 (ambience or ambient or environment\$4)	USPAT	2004/05/24 15:01
42	23	adjust\$5 near5 contrast\$4 same temperature near5 (ambience or ambient or environment\$4)	USPAT	2004/05/24 15:02
43	22	( adjust\$5 near5 contrast\$4 same temperature near5 (ambience or ambient or environment\$4)) and( processor or cpu or interfac\$4 or instruction\$1 or instruct\$4 or calculat\$5 or step\$1)	USPAT	2004/05/24 15:02
44	22	adjust\$5 near5 contrast\$4 same temperature near5 (ambience or ambient or environment\$4) and ( processor or cpu or interfac\$4 or instruction\$1 or instruct\$4 or calculat\$5 or step\$1)	USPAT	2004/05/24 15:03
45	11	adjust\$5 near5 contrast\$4 same temperature near5 (ambience or ambient or environment\$4) and ( processor or cpu or interfac\$4 or instruction\$1 or instruct\$4 or calculat\$5 or step\$1) same contrast\$4	USPAT	2004/05/24 15:05
46	11	adjust\$5 near5 contrast\$4 same temperature near5 (ambience or ambient or environment\$4) and ( processor or cpu or interfac\$4 or instruction\$1 or instruct\$4 or calculat\$5 or step\$1) same contrast\$4 and temperature near5 (ambience or ambient or environment\$4)	USPAT	2004/05/24 15:05

47	11	adjust\$5 near5 contrast\$4 same temperature near5 (ambience or ambient or environment\$4) and ( processor or cpu or interfac\$4 or instruction\$1 or instruct\$4 or calculat\$5 or step\$1)same contrast\$4 and temperature near5 (ambience or ambient or environment\$4) and contrast\$4	USPAT	2004/05/24 15:17
48	0	adjust\$5 near5 contrast\$4 same temperature near5 (ambience or ambient or environment\$4) and ( processor or cpu or interfac\$4 or instruction\$1 or instruct\$4 or calculat\$5 or step\$1)same contrast\$4 and temperature near5 (ambience or ambient or environment\$4) and contrast\$4 and (scroll\$4 or slid\$4) near3 bar	USPAT	2004/05/24 15:18
49	25455	(scroll\$4 or slid\$4) near3 bar	USPAT	2004/05/24 15:18
50	241	(ambient or ambience or environment\$4) same (scroll\$4 or slid\$4) near3 bar	USPAT	2004/05/24 15:20
51	5	(ambient or ambience or environment\$4) same (scroll\$4 or slid\$4) near3 bar and ((scroll\$4 or slid\$4) near3 bar) same contrast\$4	USPAT	2004/05/24 15:20
52	1	(ambient or ambience or environment\$4) same (scroll\$4 or slid\$4) near3 bar and ((scroll\$4 or slid\$4) near3 bar) same contrast\$4 and temperature\$1	USPAT	2004/05/24 15:20
53	72	(ambient or ambience or environment\$4) same (scroll\$4 or slid\$4) near3 bar and temperature	USPAT	2004/05/24 15:20
54	30	temperature same (ambient or ambience or environment\$4) same (scroll\$4 or slid\$4) near3 bar and temperature	USPAT	2004/05/24 15:23
55	0	contrast\$4 same temperature same (ambient or ambience or environment\$4) same (scroll\$4 or slid\$4) near3 bar and temperature	USPAT	2004/05/24 15:21
56	0	contrast\$4 near4 adjust\$5 same (scroll\$4 or slid\$4) near3 bar and temperature	USPAT	2004/05/24 15:21
57	18	contrast\$4 near4 adjust\$5 and (scroll\$4 or slid\$4) near3 bar and temperature	USPAT	2004/05/24 15:22
58	0	(temperature same (ambient or ambience or environment\$4) same (scroll\$4 or slid\$4) near3 bar and temperature) and (contrast\$4 near4 adjust\$5 and (scroll\$4 or slid\$4) near3 bar and temperature)	USPAT	2004/05/24 15:21
59	583	contrast\$4 near4 adjust\$5 and(( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4))and temperature	USPAT	2004/05/24 15:22
60	5532	temperature same (ambient or ambience or environment\$4) same (( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4)) and temperature	USPAT	2004/05/24 15:23
61	12	(contrast\$4 near4 adjust\$5 and(( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4))and temperature) and (temperature same (ambient or ambience or environment\$4) same (( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4)) and temperature)	USPAT	2004/05/24 15:25
62	9	(contrast\$4 near4 adjust\$5 and(( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4))and temperature) and (temperature same (ambient or ambience or environment\$4) same (( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4)) and temperature) and temperature near4 (ambient or ambience or environment\$4)	USPAT	2004/05/24 15:30
63	0	(contrast\$4 near4 adjust\$5 and(( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4))and temperature) and (temperature same (ambient or ambience or environment\$4) same (( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4)) and temperature) and temperature near4 (ambient or ambience or environment\$4) and contrast\$4 same temperature\$1	USPAT	2004/05/24 15:31
64	2	(contrast\$4 near4 adjust\$5 and(( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4))and temperature) and (temperature same (ambient or ambience or environment\$4) same (( (scroll\$4 or slid\$4) near3 bar ) or (gui or interfac\$4)) and temperature) and temperature near4 (ambient or ambience or environment\$4) and contrast\$4 same temperature\$1	USPAT	2004/05/24 15:54
65	1	"6285421"	USPAT	2004/05/24 15:54
66	1	"6285421" and temperature and contrast	USPAT	2004/05/24 15:55
67	1	"6285421" and temperature same contrast	USPAT	2004/05/24 15:57
68	0	"6285421" and temperature same contrast and cpu	USPAT	2004/05/24 15:57
69	0	"6285421" and temperature same contrast and processor	USPAT	2004/05/24 15:57

70	0	"6285421" and temperature same contrast and gui	USPAT	2004/05/24 15:58
71	0	"6285421" and temperature same contrast and interfac\$4	USPAT	2004/05/24 15:58
72	1	"6285421" and temperature same contrast and step\$1	USPAT	2004/05/24 15:58
73	0	"6285421" and temperature same contrast and instruct\$5	USPAT	2004/05/24 15:59

EAST - [09724811ab.wsp:1]

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Search DBs USPAT Plural Highlight all hit terms initially

Default operator: OR

59 and 60 and temperature near4 (ambient or ambience or environment\$4)

BRS form IS&R form Image Text HTML

	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current XRef	R
1	<input type="checkbox"/>	<input type="checkbox"/>	US 6512506 B1	20030128	20	Driving device for liquid crystal display element	345/99	349/94	
2	<input type="checkbox"/>	<input type="checkbox"/>	US 6496177 B1	20021217	19	Liquid crystal display (LCD) contrast control system and method	345/101	345/87	
3	<input type="checkbox"/>	<input type="checkbox"/>	US 6002787 A	19991214	43	Fingerprint analyzing and encoding system	382/125		
4	<input type="checkbox"/>	<input type="checkbox"/>	US 5574657 A	19961112	48	Electronic rate meter controller and method	700/283	700/240	
5	<input type="checkbox"/>	<input type="checkbox"/>	US 4973149 A	19901127	22	Eye movement detector	351/210		
6	<input type="checkbox"/>	<input type="checkbox"/>	US 4950069 A	19900821	27	Eye movement detector with improved calibration and speed	351/210	396/51	
7	<input type="checkbox"/>	<input type="checkbox"/>	US 4862265 A	19890829	30	CRT device light versus input signal characteristic function	348/191	348/674	
8	<input type="checkbox"/>	<input type="checkbox"/>	US 4836670 A	19890606	24	Eye movement detector	351/210	396/51	
9	<input type="checkbox"/>	<input type="checkbox"/>	US 4776798 A	19881011	16	Energy managment microprocessing training system providing instruction for	434/224	434/366; 434/379;	

Hits Details HTML



EAST - [09724811ab.wsp:1]

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Search Lib Browse Queue Clear

DBs: USPAT ☐ Plural

Default operator: OR ☒ Highlight all hit terms initially

7 and adjust\$5 same (contrast\$4 same temperature\$1) same (time or period)

BRS 1... IS&R... Image Text HTML

	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current XRef
1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6512506 B1	20030128	20	Driving device for liquid crystal display element	345/99	349/94
2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6496177 B1	20021217	19	Liquid crystal display (LCD) contrast control system and method	345/101	345/87
3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	US 6433769 B1	20020813	10	Compensation circuit for display contrast voltage control	345/101	345/211; 348/655;
4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6313821 B1	20011106	10	Image display device for automatically adjusting contrast of display image	345/101	349/72
5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6236385 B1	20010522		Method of driving a liquid crystal display device	345/95	345/94
6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5684503 A	19971104		Method of driving a liquid crystal display device	345/97	345/94; 349/33
7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5646643 A	19970708		Liquid crystal display device	345/100	345/58; 345/94
8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5619221 A	19970408		Liquid crystal display device	345/58	345/100; 345/94
9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5608422 A	19970304		Automatic contrast adjusting device	345/101	345/98; 349/161
10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5497173 A	19960305		Method and apparatus for multiplex addressing of a ferro-electric liquid	345/94	345/97
11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5398042 A	19950314		Method and apparatus for multiplex	345/94	345/101

Hits Details HTML



A screenshot of a web browser window. The address bar shows a local file path starting with 'file:///'. Below the address bar, there are three tabs: 'File', 'Details', and 'HTML'. The 'HTML' tab is currently selected, displaying the source code of the file. The main content area shows a large amount of text, which appears to be a list or index of files and directories, though it is mostly illegible due to the low resolution and noise in the image.



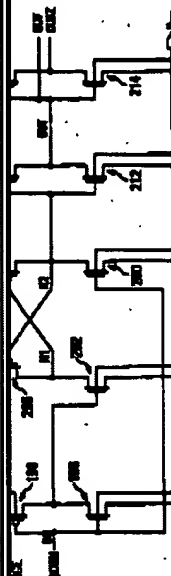
## Detailed Description Text - DETX (4):

This circuit has significant problems associated with it. Since the voltage divider circuit 12 is not provided on the voltage driver circuit, it is left to the system level designer to design a circuit to produce the drive voltages externally. Further, since  $V_{sub.cc}$  may not be stable, the variable voltage source must be used to adjust the contrast of the LCD to a comfortable level. When  $V_{sub.cc}$  is provided from a battery source, for example, the voltage level will decrease over time, requiring adjustment. In many devices, such as handheld electronic games, it is not desirable to have an external contrast control. Also, the ambient temperature will affect the contrast of the LCD display, also requiring an adjustment of the variable voltage source.

## Current US Cross Reference Classification - CCXR (3):

B45/101

Sheet 4 of 4 5,198,747



V.sub.cc

EAST - [09724811ab.wsp:1]

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Search List Browse Queue Clear

DB: USPAT ☐ Plural ☒ Highlight all hit terms initial

Default operator: OR

7 and adjust\$5 same (ambient near3 temperature)same contrast\$3

L18: (8) 7 and adjust\$5 same

BRS form ISR form Image Text HTML

	U	1	Document ID	Issue Date	Pages	Title	Current OR	Current XRef
1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6683587 B2	20040127	50	Switched mode digital logic method, system and apparatus for directly driving	345/38	345/34; 345/53
2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6496177 B1	20021217	19	Liquid crystal display (LCD) contrast control system and method	345/101	345/87
3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6309100 B1	20011030	10	LCD temperature sensing	374/183	349/12; 374/141
4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 6285421 B1	20010904	13	Liquid crystal display temperature measuring in adhesion material	349/72	345/101; 349/153
5	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5416495 A	19950516	18	Liquid-crystal display unit for electronic directory	345/87	
6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5414441 A	19950509	6	Temperature compensation apparatus for liquid crystal display	345/87	345/101; 345/89
7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5198747 A	19930330	10	Liquid crystal display driver and driver method	323/303	323/354; 327/108;
8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	US 5027111 A	19910625	14	Liquid-crystal display unit for electronic directory	345/101	

Hits Details HTML

US-PAT-NO: 6309100

DOCUMENT-IDENTIFIER: US 6309100 B1

TITLE: LCD temperature sensing

DATE-ISSUED: October 30, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lutnaes; Sturla	Ullerang.kersvagen	N/A	N/A	SE

US-CL-CURRENT: 374/183, 349/12, 374/141

ABSTRACT:

The temperature of a liquid crystal display (LCD), for example provided in a mobile telephone, is measured by covering the LCD with a conductive touch screen bottom sheet having a known resistance-temperature relationship. A temperature-stable resistor is connected to the touch screen bottom sheet, and a voltage is applied across the resistor and the sheet. The voltage signal between the resistor and the touch screen bottom sheet is measured and converted to digital representation by an A/D-converter. The measured voltage signal is used to calculate the temperature of the touch screen bottom sheet, which is substantially equal to the temperature of the LCD.

15 Claims, 8 Drawing figures

Exemplary Claim Number: 1,6,11

Number of Drawing Sheets: 5

----- KWIC -----

Brief Summary Text - BSTX (6):

For example, the abstract of the Japanese patent JP-A-9-160001 describes a LCD control system wherein the contrast of the LCD is controlled by way of measuring the ambient temperature, and adjusting the contrast after comparing the measured temperature to a stored temperature and a contrast setting associated with the stored temperature. A similar system is also described in the abstract of the Japanese patent JP-A-8-114785. Such a control system has the disadvantage that the contrast adjustment is based on an ambient temperature that may differ considerably from temperature of the liquid crystals. This is the case regardless of whether the temperature is measured outside of the equipment in which the LCD is mounted, or inside the housing of the equipment.

Detailed Description Text - DETX (20):

Furthermore, as the touch screen covers the entire LCD surface any irregularities in the temperature distribution across the display surface are smoothed out since the measured resistance is an overall value taken over the entire touch screen bottom sheet. Thereby, a proper mean value for use when determining a temperature induced contrast adjustment of the LCD is provided, rather than a point estimation.

Detailed Description Text - DETX (24):

For example, FIG. 7 schematically illustrates a mobile phone 41 provided with a LCD 43 and a touch screen 42 covering the LCD, whereby the touch screen bottom sheet is conductive, and acts as a temperature sensing element. The electronic unit of the mobile phone 41 comprises a temperature stable resistor 44, an A/D-converter 45 connected between the resistor 44 and the conductive layer of the touch screen bottom sheet 42 and a control unit 46 connected to the A/D-converter 45. The control unit 46 is programmed to perform the calculations described above. It should be noted that for simplicity voltage sources, ground potential terminals and contrast adjustment components are not shown, since these components are conventional and their use is very familiar to anyone skilled in the art. A mobile phone according to FIG. 7 has the advantage that the user is presented with a LCD that always shows information in good light contrast, regardless of the ambient temperature as well as the internal temperature of the mobile phone.

Field of Search Class/SubClass - FSCS (4):

345/101